



Effectiveness of community-based outreach in preventing HIV/AIDS among injecting drug users

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Abstract

This paper focuses on the evidence for the effectiveness of community-based outreach intervention as one component of a comprehensive HIV prevention model for preventing HIV infection in injecting drug user (IDU) populations. Three empirical questions guided the review of the evidence. This article includes primarily published literature on community-based outreach derived mostly from developing countries but also unpublished literature. Wherever possible, evidence from multi-country, multi-site studies or meta-analytical studies is included. More than 40 published studies reveal that injecting drug users (IDUs), who are reached by community-based outreach and provided with access to risk reduction services, report reducing HIV risk behaviours. The strength of the evidence was assessed using Hill's criteria, which permit a review of multiple studies with different designs. Using the criteria, it is possible to infer causation about the evidence of effectiveness of the intervention. The evidence for the effectiveness of a community-based outreach strategy is strong. Despite evidence from 20 years of evaluation studies of the effectiveness of community-based outreach, a huge gap exists in most countries between the number of IDUs who want or could benefit from outreach services and the number of IDUs who actually receive them. Findings from evaluation studies on the effectiveness of community-based outreach must be made accessible, disseminated globally and provided to policy- and decision-makers to persuade them to take action and implement scaled-up prevention programmes. This requires ongoing advocacy and constant strengthening of the evidence base. Plans are needed to link evidence-based findings with technical assistance as well as training to enhance the capacity of regions and countries to introduce, scale up and sustain HIV prevention outreach to IDUs as part of a comprehensive HIV prevention strategy. © 2005 Elsevier B.V. All rights reserved.

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Introduction

Paragraph 52 of the Declaration of Commitment of the United Nations General Assembly Special Session on

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HIV/AIDS, 2001, set a target that countries implement a comprehensive prevention programme by 2005. The components of a comprehensive HIV prevention programme include, but are not limited to, community-based outreach, access to clean needles and syringes, a range of drug dependence treatments, condom promotion and HIV voluntary and confidential testing and counselling (VCT), all within the context of a human rights-based approach.

These recommendations for preventing HIV transmission among injecting drug users (IDUs) reflect more than 20 years of research on the effectiveness of community-based interventions (Jones & Vlahov, 1998; Needle, Coyle, & Cesari, 1998; Needle, Coyle, Normand, Lambert, & Cesari, 1998; Stimson, Des Jarlais, & Ball, 1998). Results from early studies, especially the WHO multi-country study of drug injecting and HIV infection from 1987 to 1992 (Stimson et al., 1998) and the United States National Institute on Drug Abuse (NIDA) multi-site study of community-based outreach from 1987 to 1991 (Brown & Beschner, 1993), indicate that HIV epidemics among IDUs can be prevented, slowed and even reversed. Des Jarlais et al. (1998) reported that starting HIV prevention early in an epidemic, including the large-scale provision of sterile injecting equipment, community-based outreach to disseminate risk reduction information and supplies, and building trust between healthcare workers and IDUs have been associated with preventing HIV epidemics among IDUs in low-prevalence cities.

This paper focuses on the evidence for the effectiveness of community-based outreach intervention for preventing HIV in injecting drug user (IDU) populations—one component of a comprehensive HIV prevention model. The outreach strategy was originally designed to rely on current and/or former IDUs and train them as mobile teams to reach out-of-treatment IDUs for who services were not available, or were available but not accessible, or who chose not to use the available services. The outreach strategy was also designed to reach IDUs in their communities who were unable and/or unwilling to stop injecting drug use and to provide risk reduction information and services (Wiebel et al., 1996).

In most countries, the majority of IDUs remain hidden from authorities, especially law enforcement ones, and in order to protect their privacy; they also often avoid using treatment and agency-based services (Lambert & Wiebel, 1990). IDUs who could benefit most from HIV prevention services and drug treatment are the least likely to use these services (Lambert & Wiebel, 1990). Outreach is designed to reach hidden populations of IDUs in their communities, engage them in a process to reduce HIV risk behaviours and provide them with the means to enable them to reduce their HIV-related risks. In many settings, community-based outreach intervention strategies have been introduced over the past two decades where multi-person reuse of injecting equipment is prevalent and Needle and Syringe Programmes (NSPs) are not politically viable public health options.

Origins, evolution and adaptation of community-based outreach models

The community-based outreach HIV risk reduction intervention strategy was an adaptation of outreach models developed in the United States and Western Europe before HIV/AIDS emerged as a public health threat. In the United States, this model was introduced in the late 1960s in response to the high levels of heroin use. Hughes (1977) hired former heroin users to provide targeted outreach to active, out-of-treatment, hidden populations of IDUs in Chicago's drug market areas to encourage their entry into methadone maintenance treatment (MMT) programmes. In Western Europe, community-based peer outreach evolved from the tradition of reaching out to youth with drug-related problems as well as to IDUs at risk of hepatitis B and other health-related consequences of drug use.

Community-based outreach for HIV prevention has changed considerably since its introduction in the early 1980s, reflecting the changing dynamics of drug use, HIV and other blood borne infections; the availability of a greater range of prevention services; and evolutions in the knowledge base and understanding of best practices to guide implementation. Table 1 presents an overview of the conceptual basis and changes in community-based outreach models that have been implemented, evaluated and adapted for use in other countries. To a great extent, these models were developed and evaluated in Australia, the United States and Western Europe, and have been adapted for use in other countries.

The indigenous leader outreach model implemented in 1986 in Chicago, United States, relies on epidemiological and ethnographic data to target injecting drug use neighbourhoods and relies on 'insiders' with access to the IDU community, who know the rules of the street-based social system, to provide risk reduction information and supplies (Wiebel, 1988). The San Francisco MidCity Consortium to Combat AIDS, United States (Watters, Iura, & Iura, 1986) developed and field tested risk reduction prevention messages; also introducing the distribution of bleach and information on cleaning syringes. Early outreach efforts were characterized by repeated and time intensive contacts with IDUs.

These efforts and first-generation NIDA outreach models (1987–1991) were introduced before VCT was established as a component of prevention programmes and before other services for HIV-positive IDUs were available (Brown & Beschner, 1993). In some countries, the expansion of services for IDUs included the expansion of outreach models to increase opportunities for IDUs to access a range of prevention and treatment services (Needle & Coyle, 1998; Tinsman, Bullman, Chen, Burgdorf, & Herrell, 2001). The second generation NIDA community-based outreach programmes (1991–1998) incorporated the features of the earlier models and added a pre- and post-test HIV counselling component (Needle & Coyle, 1998). Such services are still not available in many countries. Detels (2004) recently reported that the key to slowing epidemics, providing treatment and increasing

Table 1
Evolution and diffusion of community-based peer outreach

Name	Year study published	Features	Target populations	Comments
Indigenous leader outreach model (Wiebel, 1988) (USA)	1988	Combines ethnographic and epidemiological methods for targeting neighbourhoods and drug users at risk and developing AIDS interventions	IDUs not in treatment	Adapted from earlier work of Hughes et al. and developed to respond to heroin outbreak in 1970s
		Relies on indigenous outreach workers	IDU risk networks	Intense street outreach focused on risk networks and individual level behaviour changes
		Identifies and accesses out-of treatment IDUs		Adapted and used model in 1995 trials to facilitate entry into drug treatment
		Increases AIDS awareness		Adapted and used in some central European and central Asian countries
Community health outreach workers model (USA)	1987	Conducts street-based risk assessment		
		Provides risk reduction		
		Reinforces risk-reduction measure		
		Targeted recruitment of community health outreach workers	IDUs	Hierarchical risk-reduction message first developed and introduced (later to be expanded)
United States National Institute on Drug Abuse community-based outreach model (USA)	1987–1991	Created hierarchical message on risk reduction		Teach and bleach
		For disinfection of injecting equipment, community health outreach workers provided:		Focused on sexual transmission of HIV in IDUs
		Risk-reduction information		Bleach incorporated into community-based interventions in Argentina, Belarus, Brazil, India, Malaysia, Nepal, Russian Federation, Thailand, Ukraine and Viet Nam
		Bleach		Some debate about effectiveness, but no debate that it provides an opportunity to engage IDUs in risk reduction
United States National Institute on Drug Abuse community-based outreach model (USA)	1987–1991	Demonstrations of skills to clean equipment		
		Targeted outreach	IDUs and sexual partners of IDUs and other people at high risk	First major national multi-site HIV efficacy study
		Indigenous outreach		Multi-site (29), multi-year programme
		Tested three different intervention models		Manuals and training materials for each model developed
United States National Institute on Drug Abuse HIV counselling and educational model		Behavioural counselling		Some referrals to VCT
		Indigenous leader outreach model		
		United States National Institute on Drug Abuse HIV counselling and educational model		

Table 1 (Continued)

Name	Year study published	Features	Target populations	Comments
Cooperative agreement programme (USA)	1991–1998	Targeted outreach Outreach and two sessions of VCT Messages on risk reduction and safer sex Provided risk reduction materials (such as bleach and condoms) Referrals to other services	Crack and cocaine smokers among IDUs	Relied on outreach workers to bridge out-of-treatment IDUs to voluntary testing and counselling sites Standardized HIV pre- and post-test counselling Adapted and used in India
Peer-driven intervention (Broadhead et al., 1998) (USA)	1994	Recruitment of network members, through use of chain referrals Active IDU peers, IDUs actively involved in recruiting and providing risk reduction, with monetary incentives provided	IDUs and their risk networks	Compared traditional outreach (provider–client approach) that uses professional outreach workers with peer-driven current IDUs as outreach workers (social network approach) More active role in recruiting other IDUs Effectiveness of peers in providing information evaluated Model implemented in Odessa and several other regions in central and eastern Europe and Viet Nam
Use of peer leaders for HIV prevention (Latkin, 1998) (USA)	1994	Identified peer leaders participated in a 10-session training programme Leaders asked to recruit risk network member(s) Outreach to networks, providing risk reduction information and discussing HIV prevention After each outreach visit, the leaders discussed experience	Risk network members including drug users and sexual partners who inject drugs	Shift from more individual-level community-based interventions to interventions designed to affect group-level influences and behaviour. Relies on outreach worker and formalizes training for their roles as peer leaders Effectiveness on the diffusion of information to others in networks assessed by interviewing the network members recruited
Center for Substance Abuse Treatment, United States Department of Health and Human Services (USA)	1995–2000	Street outreach to link high-risk populations to HIV-related services and drug treatment Provided referral or services including substance abuse treatment, HIV/AIDS risk reduction, medical diagnostic testing and screening and links to other services	IDUs and their sexual and needle sharing partners	Multi-site ($n = 12$) multi-year, with different populations at risk Trial organized around two outcomes: Persuading people at high-risk to obtain HIV tests Entering substance abuse treatment Tested effectiveness of integrating street outreach with referral to substance abuse treatment

Table 1 (Continued)

Name	Year study published	Features	Target populations	Comments
Youth model (Western Europe)	1960s	Focus on drug use and HIV prevention among IDUs	Problem youth and drug problems among youth	Original form of outreach and preceded the emergence of HIV Used in Austria, Nordic countries, France, Germany and Portugal
Catching the clients model (Western Europe)	Mid-1970s	Encourages IDUs to enter drug treatment Primary focus is to help IDUs to stop using drugs	IDUs in need of treatment	Carried out mainly by therapeutic communities and other drug treatment providers Greece, Norway and Sweden
Self-help Model (Western Europe)	Mid-1970s	Relies on IDUs to reach out to other IDUs	Active IDUs	Resulted in the formation of organizations of drug users Belgium, Denmark, France, Germany, Italy, Netherlands, Spain, United Kingdom
Public health model (Western Europe)	Mid to late 1980s	Low threshold for harm-reduction services (providing services) Bridging to institutions (drug treatment, testing and counselling and HIV/AIDS treatment)	IDUs	IDUs work with physicians and nurses to reach IDUs Most widely used model in Europe
Renewal outreach programme (Russian Federation)	1999	Outreach linked to NSPs Provide outreach in places where IDUs congregate (tusovka) Use volunteers from tusovkas for secondary exchange	IDUs	Combination of outreach and NSPs Relies on volunteers, which allows for more efficient use of resources Coverage of IDUs has been substantial

use of services, including VCT, is the implementation of programmes to reduce stigmatization and encourage empathy for HIV infected and affected populations.

While the indigenous leader outreach model focused on both IDUs and their networks in the mid to late 1990s, a number of researchers developed, field tested and evaluated other peer-driven outreach models. Conceptually, these strategies recognized that the IDUs networks are not only important determinants of HIV risk but can also be successfully used to influence IDUs to reduce HIV-related risk behaviours (Broadhead et al., 1998; Latkin, 1998). Neaigus (1998) reviewed the network approach and interventions to prevent HIV infection among IDUs. Outreach models often rely on a mix of approaches that combine individual level risk reduction with network-based components and have been introduced to reach drug-user at risk networks rather than individual IDUs. For a more thorough discussion of network-based approaches to understanding of and responding to injecting drug use, see Neaigus (1998).

The link between outreach and Needle and Syringe Programmes is characteristic of the Renewal Outreach Programme model (Badrieva, 2001). Many regions and countries

with recent HIV epidemics among IDUs have adopted a harm reduction approach to HIV prevention and other health-related consequences of drug use. Many of the more recent adaptations of outreach programmes rely on recruiting people from neighbourhoods where IDUs congregate and encouraging these individuals to use their residence as a venue for providing a range of services to enable IDUs access to the means for behaviour change.

Recently, outreach services have been linked to, and through, VCT programmes to facilitate access and adherence to antiretroviral therapies for HIV-positive IDUs. These models are being developed and will be field tested in countries such as Kenya and Viet Nam with the Centers for Disease Control and Prevention (CDC) Global AIDS Program.

Evidence of effectiveness of community-based outreach

The extent to which outreach to IDUs starts and sustains a process, resulting in reduced risk behaviour that, in turn, leads to a reduction in HIV transmission is the evidence required

to establish the effectiveness of outreach in HIV prevention among IDUs. The sections below provide a synopsis of findings from earlier reviews and updates the published and unpublished literature since 1998 with attention to reports from developing countries. The findings are reported in relation to the following three interrelated empirical questions:

1. Is outreach an effective strategy for reaching hard-to-reach, hidden IDU populations and providing the means for changing behaviour?
2. Do a significant proportion of IDUs receiving outreach-based interventions reduce their HIV risk behaviours—drug using, injecting equipment use and sexual—and adopt safer behaviours?
3. Are changes in behaviours associated with lower rates of HIV infection among IDUs?

Is outreach an effective strategy for reaching hard-to-reach, hidden IDU populations and providing the means for changing behaviour?

Outreach to IDUs has been among the most frequently implemented interventions as it can reach hidden populations of IDUs (illicit drug use is not usually performed openly in front of strangers) who are stigmatized (society views IDUs as being different and generally views them negatively). Community-based outreach can get access to and engage IDU populations in a process of risk reduction in their communities rather than intervening with IDUs who attend clinics to access services. It is essential to question the effectiveness of outreach in reaching the at-risk target population as well as how many IDUs are actually being reached. The issue of coverage is quite complicated and includes numerical coverage (how many?), percentage coverage (what share?) and setting/geographical coverage (what groups?). The UNAIDS publication *Costing Guidelines for HIV/AIDS Intervention Strategies*, February 2004 should be referred to for discussion of these issues.

There is considerable variation among regional and country-specific outreach programmes in terms of reach. Developed countries with the most mature epidemics have the most experience with community-based outreach and have also developed an infrastructure for monitoring and evaluation that permits reviews and reports of data related to utilization of services and population coverage. Data from Australia, New Zealand, the United States and Western European countries demonstrate that outreach has reached large numbers of at-risk IDU populations, including male and female IDUs as well as IDUs of different ages, various ethnicities, and who use different drugs. With regards to countries with more recent epidemics, they may have implemented more outreach than is reported as these countries may be using scarce resources for programme implementation rather than for monitoring and evaluation of service use.

Country-level reports from Western Europe reveal that large numbers of IDUs are provided condoms, needles and

syringes, risk reduction education and referrals to drug treatment services (Burkhart, 1999). In the 1980s, an outreach and NSP in Rotterdam, the Netherlands, greatly extended the reach and the quantity of supplies provided by peer outreach workers, including programme participants, who took large amounts of injecting equipment (and condoms) to houses where drugs were sold and consumed (Grund et al., 1992).

The most recent data from the United States, Substance Abuse and Mental Health Services Administration Multi-Site (12 cities) Outreach Study of high-risk IDU populations, 1995–2000, found that outreach was effective in referring IDUs to drug treatment services. Each year an estimated 750,000 to 1 million outreach contacts (covers about 250,000 IDUs), including hard-to-reach IDUs such as sex workers, homeless people, men who have sex with men and transgendered people, occur in the United States (Thompson, 2002). Of the IDUs reached in this study, 68% had been referred to treatment of whom 41% entered drug treatment. This study highlights the fact that, if services are available, outreach is an effective strategy to reach, refer and start a process that can lead to reduced HIV-related risks. The results were similar for reaching IDUs and referral to VCT.

In Latin America, Brazil and Argentina have been the most active countries in providing community-based outreach, reaching large numbers of IDUs with a range of services, including NSPs, through harm reduction centers and NGOs (Rossi, Touzé, & Weissenbacher, 2000; Touzé et al., 1999).

In Central and Eastern Europe and the newly independent states of the former USSR, very few countries have reached most IDUs through outreach (or any other method). The Czech Republic, Kyrgyzstan and Lithuania are the possible exceptions (Burrows & Alexander, 2001), and only in Kyrgyzstan has the government made a commitment to reach this group (Burrows & Holmes, 2001). In Central and Eastern Europe, most outreach programmes follow North American or Western European models (see Table 1) and are coupled with NSPs. In Central Europe, especially the Czech Republic and Slovenia, European models, including the self-help or public health models (see Table 1), are most often implemented. In Eastern Europe and Central Asia (countries such as Kyrgyzstan, the Russian Federation and Ukraine), North American models such as the indigenous leader or peer-driven intervention are frequently used.

In 1999, in Kazan, Republic of Tatarstan, the Russian Federation, a new model was developed that focuses specifically on reaching IDUs in the closed scene of apartment-based drug buying and selling (Badrieva, 2001). A total of 101 sites had been opened in the city and the programme reached 7700 IDUs (about 35% of the city's IDUs). Unfortunately, only 35 sites are still operating, mainly as a result of continued police activities around *tusovkas*, places (not necessarily apartments) where IDUs meet rather than buy drugs. Funding is insufficient to increase the number of outreach staff to the level required to reach all IDUs in Kazan. However, even with a less than optimal number of outreach workers, this process has enabled the programme to reach over 100 hid-

den networks of IDUs. With additional outreach workers and sufficient harm reduction equipment, the programme should eventually be able to reach almost every hidden network in the city with information, education and injecting equipment.

In South Asia, Bangladesh reports having reached up to 80% of IDUs in some cities (Jenkins, 2001). In all these cases, outreach is combined with NSPs. The SHAKTI IDU intervention by CARE Bangladesh began with a rapid situation assessment in 1997 and an outreach program in 1998. Preliminary findings have been reported (Beg, 1999), and IDUs behavioural surveillance results in Dhaka have been provided for 1998–1999 and 1999–2000 (Government of Bangladesh and UNAIDS, 2000). By June 1999, the average number of IDUs reached daily was 1945, rising to over 2200 on some days. Between June 1998 and June 1999, a further seven drop-in centres were opened; 31 more (paid) peer outreach workers were trained and 210 peer educators (unpaid volunteers) started training with 160 completing it. In addition, 20 medicine shop sellers were trained to act as referral points for sexually transmitted infections (STIs), abscess care and NSP services. They were also encouraged not to buy needles and syringes from IDUs (to prevent leakage from the SHAKTI project). By June 1999, the project distributed 16,213 condoms and 50,000 needles and syringes per month.

India also has large scale outreach programmes connected to both NSPs and buprenorphine substitution treatment in Chennai, Delhi, Kolkata (former Calcutta) and Mumbai. Outreach programmes have been implemented in some states of India. The State of Manipur is scaling up its NSPs and outreach interventions in an attempt to reach most IDUs. A village in Manipur reported reaching almost all IDUs (750 of 850). Over 18 months, they reported 5939 contacts with IDUs with 3930 bleach kits and more than 4700 condoms distributed (Hangzo et al., 1997). In a Delhi slum, a drop-in centre provides a range of services to IDUs and acts as a base for outreach workers (Dorabjee, Ravi Priya, Samson, Singh, & Varma, 2001). Although, for the evaluation, the outreach component was not separated from the drop-in services, the researchers found that the programme had been very successful in reaching IDUs, contacting 3415 between May 1999 and July 2001 compared with a target of 500 clients and served as an effective bridge to drug dependence treatment.

In Southeast Asia, there are countries scaling up outreach and other countries beginning to introduce small-scale programmes. Viet Nam has recently scaled up its outreach programmes, reaching large numbers of IDUs and referring them to newly established, anonymous VCT sites. In 2000, 21 of the 61 provincial AIDS committees in Viet Nam reported disseminating risk reduction information to increase HIV/AIDS awareness and to reduce risk behaviours among IDUs. More recently, Viet Nam has introduced community-based outreach for sex workers, many of whom are also IDUs. Small programmes, usually without NSPs (or in some places the unofficial exchanging of needles), have begun in China, Indonesia, Malaysia, Mongolia, Myanmar and Thailand. Thailand has recently introduced community-based out-

reach in Bangkok and this has since been extended to other parts of the country.

There are very few outreach programmes specifically for IDUs in Africa or the Eastern Mediterranean despite findings that 15 African and 12 Eastern Mediterranean countries have identified drug injecting in their communities. Of these 27 countries, 17 have found HIV among IDUs (Ball, Rana, & Dehne, 1998). Three sub-Saharan countries—Kenya, Nigeria and South Africa—have the potential for HIV epidemics in IDU populations within the context of overwhelming heterosexual epidemics. Injecting drug use has also been described as a major problem in Mauritius. Kenya is planning to introduce an outreach program for IDUs including referral to VCT and HIV treatment. The Islamic Republic of Iran is developing outreach programmes as a component of their national harm reduction strategy with most outreach services targeting IDUs being developed in association with community-based “Triangular Clinics” that provide services addressing HIV/AIDS, STIs and drug use. These services are being expanded throughout the country. A pilot outreach programme, including needle and syringe provision, is being implemented in Tehran (World Health Organization Regional Office for the Eastern Mediterranean, 2004).

In most countries, there is great difficulty in reporting how many IDUs are being reached and estimations of the number of IDUs are either not available or are problematic because of underreporting. Consequently, reports do not permit an accurate estimation of coverage or the proportion of the population reached. Furthermore, the number of IDUs is often underestimated as sampling is frequently based on drug treatment agencies and other institutional sources, such as prisons. Consequently, except for a few countries, reporting with confidence about coverage or the proportion of the IDU population reached by community-based outreach is difficult. However, recent work on estimating the number of IDUs globally and regionally has estimated that there are 13.2 million IDUs worldwide (Aceijas, Stimson, Hickman, & Rhodes, 2004).

To summarize, there is no doubt that over the years outreach has expanded regionally, nationally and locally, and has been an effective strategy to reach hidden and marginalized populations. There is also no doubt that a huge gap exists in most countries between the number of IDUs who want or could benefit from outreach services and the number of IDUs who actually receive them. There are also many countries with emerging HIV epidemics among IDUs that have yet to introduce community-based outreach programmes.

Reaching as many people as possible through outreach to enable them to change their behaviour is critical to having an impact on HIV epidemics. It is somewhat difficult to set targets for prevention coverage, since planners often do not have estimates of the size of the at risk populations. Nevertheless, the following best practices, derived from experiences over many years, will increase the reach of outreach programmes: Outreach workers (former and/or current IDUs) have to gain the trust of IDUs, go to where the drug users and their net-

works congregate and at the times when they are at greatest risk and provide multiple means for behaviour change such as risk reduction information, needles and syringes where possible and referrals.

Other factors that will increase the effectiveness of outreach workers in reaching as many IDUs as possible, include sufficient training, payment for services, access to services to help address issues of burnout, relapse and health-related issues as well as adequate supervision. Of great importance is a policy environment that is supportive of HIV prevention programmes for IDUs and multi-sectoral institutional support for the outreach programme (Burrows, 2003).

Do a significant proportion of IDUs receiving outreach-based interventions reduce their HIV risk behaviours—drug using, injecting equipment use and sexual—and adopt safer behaviours?

Accumulated evidence from more than 40 different studies mostly from the United States using observational and quasi-experimental designs strongly indicates that outreach-based interventions have been effective in reaching out-of-treatment IDUs and providing the means for effective behaviour change (Coyle, Needle, & Normand, 1998). Some of these include NSPs but most do not. (This is not surprising as most studies were undertaken in the United States where the Federal Government does not fund NSPs. These studies may have referred drug users to needle exchange but, by and large, NSPs did not exist at the time of these studies. As such it is not possible to compare the studies. It is recognized that where NSP exists, this is an advantage in helping IDUs reduce their risk taking behaviours.)

Specifically, these studies consistently reported significant and strong post-intervention reductions in: cessation of IDU (10 of 11 studies); injecting frequency (17 of 18 studies); multi-person reuse of syringes (18 of 22 studies); use of other injecting equipment (9 of 13 studies); and crack cocaine use (all 8 studies).

These studies also reported increased needle disinfection as, generally, outreach protocols included risk-reduction information about disinfecting needles (11 of 17 studies), increased entry into drug treatment (7 of 8 studies) and increased condom use (18 of 21 studies).

More recent research by Broadhead et al. (1998), Cottler et al. (1998), Goldstein, Deren, Kang, Des Jarlais, and Magura (2002), Latkin (1998), and a study by Kumar, Mudaliar, and Daniels (1998) in Madras, India, confirm earlier findings that community-based outreach results in self reported reductions in HIV-related risk behaviours. Post-intervention changes in IDU risk behaviour have also been reported in other countries—Belarus, India, Indonesia and the Russian Federation.

In India, Kumar et al. (1998) reported on community-based outreach to IDUs in Madras. The outreach programme included reaching IDUs on the street, face-to-face education

about HIV/AIDS risk reduction information and provision of bleach and condoms. IDUs participated in three education sessions to raise awareness, reinforce perception of risk and receive information about services, including referrals to VCT. The researchers reported significant declines in injecting risk behaviour among IDUs but found that sexual risk behaviour was more difficult to change.

IDUs in communities with outreach programmes reported greater changes than those without such programmes. The effectiveness of an outreach programme in the absence of NSPs was evaluated in Denpasar, Bali, Indonesia (Desembriartista, 2001). The programme carried out research and outreach to provide information on HIV/AIDS, STIs, and hepatitis B and C; promote safer injecting and safer sex; and provide referrals and counselling. In addition, the office was used as a drop-in centre. Responses from IDUs from before the programme started were compared with those received after 1 year. Although the sample size was small, the study found increases in HIV/AIDS awareness, knowledge of how to clean needles and syringes, actual cleaning of equipment, use of new needles and syringes, increases in condom use and an overall decrease in injecting.

In Yaroslavl, Russian Federation, it has been reported that a peer-driven intervention outreach programme significantly reduced the sharing of drug preparations, injecting equipment and water used in injecting among the city's IDUs over a 2-year period.

Studies from the United States and India reveal that IDUs are less likely to reduce risky sexual behaviour than to change drug use and needle practices. Outreach-based peer programmes have been repeatedly reported to be more effective in enabling IDUs to change drug using and needle risk behaviours than sexual behaviour (Kumar et al., 1998). This is not surprising, as most interventions specifically targeted changing drug use and needle practices. Semaan et al. (2002) analysed 33 studies (most including outreach) and reported reduced unsafe sex and increased use of condoms among IDUs in intervention programmes. The reductions were greater than those in the comparison groups of IDUs, who were not part of the intervention programme, though this group also reported reductions. Although the findings showed reduced risk, the magnitude of the change was not significant.

Goldstein et al. (2002) reported that street outreach in combination with other interventions was effective in assisting IDUs to re-enter MMT programmes. Kwiatkowski, Booth, and Lloyd (2000) reported that opiate-dependent IDUs recruited by street outreach workers and offered free MMT were more likely to enter and remain in treatment than those who had to pay for treatment. In addition, outreach is effective if it is combined with referral programmes that make services accessible by providing transport (Tinsman et al., 2001). Tinsman et al. reported employing mobile units to provide VCT services on the street, illustrating that on-site testing increases the likelihood that these services will be used. Clients of projects with mobile units were 86 times

more likely to undergo a HIV test than clients of projects without mobile units. Furthermore, clients of projects with on-site HIV testing were 21 times more likely to undergo a HIV test than clients referred to services. Thompson, Phields, Atanda, and Mulvey (2002) report that prevention-related services, including peer outreach and drug treatment services, resulted in reduced HIV risk behaviour related to IDU and sex among alcohol and injecting drug users.

In summary, outreach is an effective strategy for reaching and enabling IDUs to reduce their HIV risk behaviours. Furthermore, referral of IDUs to other services such as VCT and drug dependence treatment results in utilization of services and can help sustain behaviour change.

Are changes in behaviours associated with lower rates of HIV infection among IDUs?

A critical question in evaluating the effects of community-based outreach on the HIV epidemic is determining whether post-intervention reductions in risk behaviour result in fewer infections. The number of empirical studies is limited. Wiebel et al. (1996) provided the strongest evidence that participants in outreach can reduce their HIV risk behaviour (especially multi-person reuse of syringes) and results in reduced exposure to HIV. Wiebel et al. conducted a prospective study of intensive street-based outreach intervention in Chicago, United States, using the indigenous leader outreach model. Former IDUs delivered HIV prevention services in community settings. The authors employed a quasi-experimental design, collecting baseline and 6-month follow-up data from IDUs who were at risk (seronegative at baseline) through their reuse of needles, syringes or other injecting equipment ($n = 641$) between 1988 and 1992. The authors added a non-equivalent control group that was not exposed to outreach intervention. (A non-equivalent control group does not share identical characteristics with the experimental group in the intervention and somewhat limits the interpretation of the causal impact of outreach on seroconversion.)

Wiebel et al. reported that the proportion of out-of-treatment IDUs in the intervention group reporting risk behaviour related to injecting declined from 54% at baseline assessment to 14% in the final sixth year of follow up. Sexual risk behaviour also decreased, but the changes were less dramatic. The seroincidence among outreach participants declined from 8.4 to 2.4 per 100 person-years. Injecting risk was the only behavioural risk factor associated with a reduction in HIV seroincidence risk. Seroconversion was associated with injecting risk behaviour (risk ratio = 9.8). In the non-equivalent control group not exposed to outreach interventions, 50% reported risk taking injecting practices. In the outreach intervention group, only 14% of the IDUs reported risk taking injecting practices. Wiebel et al. attributed reduced HIV infection in the outreach group to reductions in injecting-related risk behaviours. The study design is strong, and the results support the interpretation that outreach reduces expo-

sure to HIV and prevents HIV transmission. This study has not been replicated.

Des Jarlais et al. (1998) demonstrated in a WHO study that intervening before HIV prevalence reaches 5% among IDUs through the introduction of a range of prevention activities has helped cities maintain low HIV prevalence. Des Jarlais et al. linked seroprevalence and risk behaviour data with reports from local experts to test the hypothesis that introducing a comprehensive HIV prevention programme that includes early intervention, the large-scale provision of sterile injecting equipment and community outreach to disseminate AIDS information as well as risk reduction supplies in order to build trust between health care workers and IDUs would result in lower seroprevalence. All outreach programmes provided referrals to other services, including drug treatment and VCT. Des Jarlais et al. concluded that the evidence available at the time indicated that HIV-1 epidemics can be prevented in IDUs, who are especially vulnerable. The authors addressed the limitations of the design and examined the data in terms of making causal inferences about preventing HIV epidemics. As there were multiple HIV prevention components, the relative contribution of outreach cannot be disentangled from the other intervention components.

Investigating the casual relationships

Hill's (1971) criteria were used in earlier reviews for evaluating the evidence of the effectiveness of community-based outreach in preventing the spread of HIV infection among IDUs (Coyle et al., 1998). These criteria are relied on to assess the evidence and infer causation from observational studies. Specifically, Hill's criteria include reviewing the cumulative evidence related to a temporally correct association (an appropriate time sequence between the intervention and the observed outcome). An effort is made to determine whether outreach results in post-intervention reductions in risk behaviours associated with HIV transmission. Hill also identified consistency among findings of similar association by different investigators, in different places, under different circumstances and at different times as an important criterion in interpreting causation from observational studies. This paper reports data for community-based outreach in different countries with variation in HIV incidence and prevalence, and differences in the infrastructure available to respond to HIV epidemics among IDUs.

Additional criteria include the strength of association between the intervention and observed outcome and the specificity of the association and dose-response relationship. A most important criterion is related to the behavioural and biological plausibility of the cumulative findings. For examples: Is it possible to attribute causation in the context of current knowledge? Is there evidence available that community-based outreach has reached the populations at risk? Is there evidence available that community-based outreach has provided the means for changing behaviour, espe-

cially the means that would enable IDUs to reduce multi-person reuse of syringes? Were reductions in risk behaviours associated with reduced HIV incidence?

Hill's criteria and the accumulated evidence on the effectiveness of community-based outreach in preventing HIV transmission in IDUs are summarized in Table 2. Review of more than 40 studies indicates consistency in the direction and strength of the association between outreach and the specificity of behaviour change. The magnitude of post-intervention changes in risk behaviour is substantial. Reports are consistent that interventions targeting IDU-specific risk behaviours related to drug use and needle practices reduced these types of risk behaviours. These findings have been consistently reported by different investigators, in different places, under different circumstances and at different times during the HIV pandemic.

Interventions focused on providing risk reduction information and referrals to related services also resulted in specific behaviour changes. Outreach is designed to bridge out-of-treatment IDUs to services, starting a process that often results in increased use of services. For examples, those IDUs, who were referred to drug treatment and for whom drug treatment was available, entered treatment and the results were similar for VCT. Most recently, reports of interventions targeting IDUs who dropped out of MMT programmes reveal that outreach in combination with other interventions was effective in assisting these people in re-entering treatment (Goldstein et al., 2002). Initially, IDUs who dropped out of treatment were not willing to re-enter treatment. Repeated contact with the outreach worker established trust and facilitated treatment re-entry. Differential effects of entry into treatment and use of VCT occurred when investigators provided mobile services and/or introduced these services into their own programmes rather than referral to other agencies (Rowden et al., 1999; Tinsman et al., 2001).

Strong evidence indicates that outreach reaches at-risk HIV vulnerable populations, provides the means to reduce the risk associated with multi-person reuse of syringes, results in reports of reduced sharing of syringes and other injecting equipment, and increases the use of other services, particularly VCT and drug treatment services. Outreach programmes linked to NSPs and/or through referrals to NSPs increase the likelihood that IDUs will have access to the means to reduce their risk behaviours associated with multi-person reuse of syringes. One major study (Wiebel et al., 1996) indicated that reductions in multi-person reuse of syringes among IDUs reached by outreach were followed by reductions in seroincidence. Pinkerton et al. (2000) used a mathematical model of sexual and injecting-related HIV transmission to evaluate the effectiveness of the United States' National AIDS Demonstration Research Program. They analysed a sub-sample of 8 of 29 sites and reported, based on their cost threshold analysis, that 129 cases of HIV infection among 6629 partners were averted and that the costs of preventing HIV infection are much lower than treating it.

Though individual studies on the effectiveness of outreach have methodological limitations, the cumulative literature satisfies Hill's criteria and suggests that outreach is an effective strategy for reaching and enabling IDUs to begin, and sustain, a process HIV risk reduction.

Discussion

In the 1980s, community-based outreach was the most feasible and potentially effective public health strategy to reach and enable hidden IDU populations to change their behaviours and reduce their risks of acquiring and transmitting HIV and other blood borne infections. Since the 1980s, community-based outreach programmes have been introduced in many settings where multi-person reuse of injecting equipment is prevalent and NSPs are not a viable option. Over time, the community-based outreach model has evolved, reflecting the changing dynamics of drug use, HIV and other blood borne infections, the availability of a greater range of services, and the evolving knowledge base and best practices to guide the implementation of this strategy.

Community-based outreach is designed to reach IDUs and other vulnerable populations at risk of HIV infection. Community-based outreach typically relies on indigenous members of the community (most of who are former IDUs and some current IDUs) to access out-of-treatment IDUs, establish trust and rapport, and initiate risk reduction activities including referral to other services on the streets and/or in neighbourhood settings. The outreach strategy has been expanded to include sexual partners of IDUs, non-injecting drug users, IDUs' networks and other vulnerable populations such as women and at risk youth. This review makes it clear that the adjunct services available to vulnerable populations (drug treatment, VCT and NSPs) vary considerably.

Outreach workers often provide risk reduction messages related to drug use, injecting and safer sex as well as risk reduction supplies to enable IDUs to adopt safer practices. When possible, outreach workers also refer IDUs to other services including VCT, drug dependence treatment, NSPs, other health services and referral for HIV treatment. Specifically, community-based outreach is designed to enable IDUs to reduce risk behaviours, including multi-person reuse of syringes and other injecting equipment, and unprotected sexual intercourse, and to adopt safer behaviours such as using new, sterile injecting equipment, disinfecting needles and syringes and increasing condom use.

Evidence from more than 40 studies and additional unpublished reports indicate that community-based outreach reaches hidden populations vulnerable to HIV, provides credible risk reduction information and the means for behaviour change to enable IDU populations to reduce drug use, to reduce reuse of syringes and other drug injecting equipment, to increase condom use and, if IDUs are referred and the ser-

Table 2

Interpretation and summary of evidence-based findings on the effectiveness of community-based outreach in preventing HIV transmission in IDUs

Criteria	Findings summarized	Comments
Temporality—correct association with appropriate time sequence between intervention and observed outcomes	Post-intervention reductions in risk behaviour reported in more than 40 studies Groups not in interventions do not show reduced risk behaviour Post-intervention change in testing and counselling and in entering and re-entering drug treatment repeated in 10 studies targeting this behaviour	Design of studies with behaviour at baseline and follow-up support the interpretation that outreach led to reduction of HIV infection risk in IDUs exposed to intervention
Consistency of finding similar associations by different plans under different circumstances	Outreach has been effective in reaching populations in all regions of the world where it has been implemented Outreach has been effective in enabling IDUs to reduce risk behaviour starting in the 1980s, continuing throughout the 1990s and into the third decade of the epidemic Outreach has been effective in reducing risk behaviour in countries with both limited and substantial public health capacity	Evidence strong and consistent that IDUs reached by community-based outreach over time and in different countries report reductions in risk behaviour
Specificity of association is limited to specific participants or specific outcomes	Outcomes—post-intervention changes in targeted behaviour (drug use and needle practices) Post-intervention use of services referred by outreach workers Smaller changes in sexual risk practices	Outreach provides risk-reduction messages and means for behaviour change, including referral to other services The IDUs reached by community outreach workers utilized services when they were available
Dose–response relationship	Very few data available	Data too limited to infer that the more outreach, the greater the change in behaviour
Plausibility (causation is feasible in the context of current knowledge)	At-risk populations reached by outreach Provided means to enable IDUs to reduce risk behaviour and/or increase protective behaviour Reductions in risk behaviour reported, especially multi-person use of syringes Incidence of HIV transmission in IDU group exposed to outreach lower than that of IDU group not exposed to outreach	Epidemiological studies publication that multiperson reuse of syringes is related to HIV transmission, and evaluation studies of outreach indicate that: Outreach is an effective method of enabling IDUs to reduce their risk behaviour One study directly links reduction in risk behaviour to reductions in HIV

vices are available, to use drug dependence treatment, VCT and other services. Reducing risk behaviours greatly reduces HIV transmission.

Community-based outreach is a comparatively low-cost effective intervention for preventing HIV infection among IDUs. It is, therefore, particularly well suited to resource constrained settings and can be rapidly scaled up. Outreach is often the first step in establishing HIV prevention, treatment, care and support programmes among IDUs. There are now tools and guidelines to train outreach workers and the evidence base enables planning, implementation and evaluation of programmes designed to reach IDUs and other vulnerable populations (NIDA, 2002; World Health Organization, 2004).

Despite evidence of the effectiveness of community-based outreach from 20 years of evaluation studies, a huge gap exists in most countries between the number of IDUs who want or could benefit from outreach services and the number of IDUs who actually receive them. Findings from evaluation studies on the effectiveness of community-based outreach must be shared, made accessible, rapidly communicated and disseminated globally.

The evidence of effectiveness needs to be provided to policy- and decision-makers to guide their decisions. This is not always sufficient to persuade them to take action and implement scaled-up prevention programmes. Ongoing advocacy and strengthening the evidence base are required as well as plans to link evidence-based findings with technical assistance and training to enhance the capacity of regions and countries to introduce, scale up and sustain HIV prevention outreach to IDUs as part of a comprehensive HIV prevention strategy.

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